Factorising - 3 terms where coefficient of $x^2 \neq 1$ ('a' $\neq 1$)

$ax^2 + bx + c$ *always check if a common factor can be removed first (to make a = 1), if not follow this method *

① find a factor pair of 'a x c' that adds to 'b'
② replace 'bx' by x x each factor
③ Separate four terms and factorise as 2x 2terms
④ check that brackets are equal
⑤ factorise again to finish with 2 brackets

eg $2x^2 + 5x + 3$

① $a \times c = 2 \times 3 = 6$ $\quad 1 \ -1 \ (2) \ -2$ $\quad 6 \ -6 \ (3) \ -3$ } adds to 5?

$= 2x^2 + 2x + 3x + 3$

Always ensure that number order of xs allow for factorising

③ $= 2x(x+1) + 3(x+1)$
$(x+1)(2x+3)$

④ ✓ brackets are the same $(x+1)$
⑤ take $(x+1)$ out as common factor and put what's left in second bracket.

eg $3x^2 + 2x - 5$ ① $a \times c = -15$ $\quad -15 \ 15 \ -5 \ (5)$ $\quad 1 \ -1 \ 3 \ (-3)$ } adds to 2?

$= 3x^2 + 3x + 5x - 5$
$= 3x(x-1) + 5(x-1)$
$= (x-1)(3x+5)$

eg $4x^2 + 11x - 3$ ① $a \times c = -12$ $\quad -12 \ (12) \ -6 \ 6 \ -4 \ 4$ $\quad 1 \ (-1) \ 2 \ -2 \ 3 \ -3$ } adds to 11?

$= 4x^2 + 12x - x - 3$
$= 4x(x+3) - 1(x+3)$
$= (x+3)(4x-1)$

Remember you can always check by expanding again to see if you get original expression!